Message

From: Praskins, Wayne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4F47BC0A2C2E42A98347D59CD1A98B19-WPRASKIN]
Sent: 5/7/2020 8:24:34 PM
To: Stralka, Daniel [Stralka.Daniel@epa.gov]
Subject: RE: HPNS: Ingestion exposure assumptions

Dan –

You could email Stuart or Fred about the BPRG not working. Your problem sounds familiar. – it's possible they have a workaround.

Your outlined response looks good. Since you don't see a clear basis for changing the parameter values I intend to tell the Navy we cannot, at this time, support use of the modified values. I see the burden as on the Navy to demonstrate a strong basis for the use of any modified values.

I'll look for your response tomorrow. Thanks.

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From: Stralka, Daniel <Stralka.Daniel@epa.gov>
Sent: Thursday, May 7, 2020 11:15 AM
To: Praskins, Wayne <Praskins.Wayne@epa.gov>
Subject: RE: HPNS: Ingestion exposure assumptions

Wayne, why can I not get the BPRG to work? I was trying to see what effect the Navy's proposed changes would make, but if I do user define exposure assumptions it doesn't give me dust PRGs?

I will write up some specific responses tomorrow morning but her is my proposed approach. Overall they are putting a degree of precision into the calculations that is not warranted by the modeling nor the measurements, they should be one or at best 2 significant digits.

1. Hand to mouth frequency- The values from Chapter 4 of the EFH are still appropriate and should continue to be used. Overall, a frequency of 3 and 17 are health protective and consistent with the studies presented. The modeling efforts were attempts to use a probabilistic approach to answer the question of overall hand to mouth transfer. Using significant digits we are talking 2 vs 3. No difference consider ing the range of uncertainties.
2. Fingertip surface area. The Navy's proposal misrepresents the cited paper's data. While they site the surface area values, these are for only one hand, doubling them the surface area of the 3 fingertips would be 23 and 8 cm2 for adult and child, respectively. While the BPRG used 49 and 16 cm2 based on 5% of both hands surface area for adults and children, respectively, this too is only a factor of 2. Do you want to give that to them since this is an empirical value vs a percentage reconstruction? We could argue that it is not significant in the scheme of things.

I would still like to see haw this would change the numbers, but they are really trying to cook the books and risk it away.

From: Praskins, Wayne <Praskins.Wayne@epa.gov>
Sent: Friday, May 1, 2020 10:52 AM

To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: FW: HPNS: Ingestion exposure assumptions

Dan –

Will you have time to look into this today?

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From: Praskins, Wayne
Sent: Monday, April 27, 2020 11:11 AM
To: Stralka, Daniel <Stralka.Daniel@epa.gov>
Subject: HPNS: Ingestion exposure assumptions

Dan –

As we discussed, we have been working with the Stuart and the Army Corps to evaluate the Hunters Point remediation goals (RGs) for radiological contaminants in buildings. The RGs were adopted back in 2006 and have been incorporated into multiple RODs at the site.

The Navy evaluated the RGs by running the numbers through EPA's Building PRG calculator (BPRG) and DOE's RESRAD BUILD calculator. The risks associated with the RGs are much higher using BPRG compared to RESRAD. As an example, for radium-226, the RG is 100 dpm/100cm2. The estimated risk is two orders of magnitude higher using BPRG compared to RESRAD BUILD (2.9 x 10-4 vs. 3 x 10-6).

The BPRG calculates ingestion dose as the product of four factors: (surface concentration) x (hand-to-mouth frequency) x (fingertip surface area) x (saliva extraction factor)

The Navy has proposed changing some of the default inputs into the BPRG, including the following:

BPRG Input	**BPRG default**	**Navy proposed change**	**Navy rationale for proposed change**
Hand to mouth frequency	3 hr^{-1} (adult)	1.64 hr^{-1} (adult) (No change proposed for child.)	*"Average for Age 7-26 from EPA 2000 page D-4). The BPRG default values for FQ (17 events/hr child and 3 events/hr adult) are based on the 2011 Exposure Factors Handbook Table 4-1. However, there is no data for adults older than 11 years and the BPRG default values are based on those for 6-11 years. The 2017 update to Chapter 5 of the EFH uses 1 event/hr for adults (Pages 5-37, 5-65). From the 2003 World Trade Center report page D-5, the time-weighted average for adults age 7-26 is a minimum of 1.35/hr, maximum of 1.92/hr and an average of 1.64/hr."*
Fingertip surface area	49 cm^2 (adult) 16 cm^2 (child)	11.5 cm^2 (adult) 3.7 cm^2 (child)	*"Area of three fingertips from Sahmel et al.,2014 rather than full area of three fingers). The EPA default for saliva extraction factor is 50% based on pesticide studies in 1994. A 2014 study (Sahmel et al.) of transfer of lead to three fingers found the factor is 24% and is more applicable to the Navy contaminants. The authors note similar in 3rd para of their introduction. See https://academic.oup.com/annweh/article/59/2/210/2740608. In the same paper, they measure the area of three fingertips. The BPRG assumes that dust is transferred from an area equivalent to three fingers, not just the tips. The paper is more accurate and their value of 11.5 cm2 for the area of three adult fingertips is*

			*used. The EPA hand areas for adults (980 cm2) and children (317 cm2) are used to get the area of three child fingertips, or 11.5*317/980 = 3.7 cm2."* (Although they comment on the saliva extraction factor, the Navy is not, as far as I can tell, proposing to reduce the default value of 50%)

The BPRG Users Guide says the following about the sources of the default values:

- **Frequency of Hand to Mouth (FQ)**

The exposure factors handbook (EPA 2011, Table 4-1) and the World Trade Center report (EPA 2003) provide hand to mouth contact rates for many age groups. For the child FQ, all age groups for mean indoor contact from birth to 6 years old were time-weight averaged from the exposure factor handbook. Missing data points were substituted with data from the nearest age group. The FQ for children was determined to be 17 times/hr.
For the adult FQ, all age groups for mean indoor contact from 6 to 26 years old were time-weight averaged from the exposure factor handbook and World Trade Center report. The FQ for adults was determined to be 3 times/hr.

- **Surface Area (SA)**

In general, this is the skin area contacted during the mouthing event. The OPP recommended default was based on the surface area of the 3 fingers that a child will most likely use for hand to mouth transfer. It was assumed that 3 fingers of one hand represents about 5% of the total area of both hands (EPA 2003). The exposure factor handbook (EPA 2011, Table 7.2) presents hand surface areas for adults and children. For children, the surface areas were time-weight averaged across all age groups from birth to 6 years (317 cm), and the 5% assumption was applied to derive the child hand surface area of 16 cm .

The hand surface area for the adult was also derived from data presented in the exposure factor handbook (EPA 2011, Table 7.2). The exposure factor handbook presents hand surface areas for adult males and females of 1070 and 890 cm , respectively. These numbers were averaged to 980 cm , and the 5% assumption was applied to derive the adult hand surface area of 49 cm .

Can you evaluate and let me know if you think there is a valid basis for the Navy's proposed changes (or other changes from the default values)?

That would be great if you could get to it this week (by 5/1/20). Thanks.

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